A Framework for ICTA National Foundational Digital Literacy Skills Training of Citizens in Kenya

ABSTRACT

This article presents a structured framework developed for the training of the ICT Authority (ICTA) of Kenya's foundational digital literacy skills to citizens, especially in marginalised areas. The study aims to evaluate the effectiveness of the training framework in narrowing the digital divide and empowering communities. Utilising a mixed-methods approach, including baseline and endline surveys and statistical analysis (paired t-tests and effect sizes), the article assesses the impact of digital training on over 87,000 citizens in the Mandera and Busia counties. Results demonstrate significant improvements in digital skills, with large effect sizes (Cohen's d ranging from 1.14 to 1.25) and consistently high post-training scores across modules. The findings underscore the effectiveness of the training framework and highlight gaps in reaching individuals with disabilities. The study concludes that a standardized, inclusive, and scalable framework is essential for national digital empowerment and recommends policy support, public-private partnerships, and targeted interventions to enhance the framework's reach and sustainability.

1. INTRODUCTION

The digital divide in Kenya remains a significant barrier to inclusive socio-economic development. Despite advancements in ICT infrastructure, disparities in access to digital technologies and skills persist, particularly between urban and rural populations, as well as among different socio-economic groups(Okello, 2024). Limited access to affordable internet, inadequate digital literacy training, and socio-economic constraints hinder many citizens from fully participating in the digital economy and accessing essential services, including education, healthcare, and government resources (ICT, 2025; Okello, 2024).

Digital literacy is a critical enabler of social and economic empowerment. The ability to effectively use digital tools enhances employability, fosters entrepreneurship, and improves access to information and government services (WeAreSocial.org, 2025). Moreover, digital literacy promotes civic engagement and bridges knowledge gaps, allowing individuals to leverage technology for personal and professional growth. Without foundational digital literacy, citizens remain disadvantaged in an increasingly digital world, exacerbating socio-economic inequalities.

The Information and Communication Technology Authority (ICTA) of Kenya plays a central role in promoting digital literacy. ICTA has spearheaded various initiatives to enhance digital skills across different demographics, including students, public servants, and entrepreneurs. However, despite these efforts, there is still a lack of a comprehensive, targeted framework that ensures the implementation of foundational digital literacy skills for all citizens. Current approaches are often fragmented and do not adequately address the needs of marginalized communities, leading to persistent gaps in digital empowerment. The absence of a structured and standardized framework for digital literacy presents a major challenge. While various digital literacy programs exist, their effectiveness is limited by inconsistent curriculum structures,

inadequate training methodologies, and lack of coordination among stakeholders(ICT, 2025; Okello, 2024). There is a pressing need for a targeted framework that systematically implements foundational digital literacy skills, ensuring accessibility, scalability, and sustainability of digital literacy initiatives. This study argues that a well-structured and targeted framework for foundational digital literacy skills, spearheaded by ICTA, is essential for bridging the digital divide in Kenya. Such a framework will empower citizens with the necessary digital skills, enhance socio-economic opportunities, and contribute to national development in the digital era. The paper objective is

- To develop and validate a model of training citizens used in this project effective in training ICTA digital Literacy skills

2. LITERATURE REVIEW

Digital literacy in this study refers to having access to the internet along with the relevant skills to use, question and create in the digital environment (Lohr, 2025). Digital literacy is essential in the 21st century for employability, social engagement, and political involvement, amongst others. Digital literacy is mentioned as on the core skills in UNESCO's Global Framework for Adult Learning and Education Marrakech Framework for Action (MFA) (Lohr, 2025; Ojokheta & Onimisi, 2025). One of the core principles for defining digital literacy in the UNESCO framework states that digital literacy also encompasses an understanding of how adults engage as active members of the society in the digital environment and the importance of critical thinking skills, communication, empathy and social skills when navigating online environments to counteract mis- and disinformation(Ojokheta & Onimisi, 2025). No doubt the term is complex and carries with it a lot of meaning in terms of one's ability to access, understand, use and navigate the digital environment.

There are studies pointing to the impact of digital literacy on citizen empowerment. First, (Lohr, 2025) stated that digital literacy has a significant impact on citizen empowerment by enhancing access to information, improving economic opportunities, and fostering social inclusion. In an increasingly digital world, the ability to navigate online platforms enables individuals to access essential services such as education, healthcare, and e-government initiatives, reducing barriers to information and participation. These impacts have also been mentioned by other authors (Ojokheta & Onimisi, 2025; Okello, 2024; Zhang, 2025). Digital literacy equips citizens with the skills needed for the modern workforce, increasing employability and enabling entrepreneurship through online businesses and digital marketing(Lohr, 2025). It also strengthens civic engagement by allowing people to participate in digital democracy, express their opinions, and advocate for their rights. Without foundational digital literacy, many individuals remain excluded from the benefits of technological advancements, widening socio-economic inequalities(Lohr, 2025; Okello, 2024). Therefore, fostering digital literacy is a crucial step toward empowering citizens, ensuring they can fully participate in and contribute to an increasingly digital society.

2.2 Challenges and Opportunities in Implementing Digital Literacy Programs in Rural and Marginalized Areas

Implementing digital literacy programs in rural and marginalized areas presents both challenges and opportunities. One of the key challenges is the lack of infrastructure, including limited electricity supply and inadequate internet connectivity, which makes access to digital tools and training difficult(Okello, 2024). Additionally, the high cost of digital devices and internet services remains a significant barrier for low-income households. Socio-cultural factors, such as limited awareness of the benefits of digital literacy and traditional resistance to technological adoption, also hinder widespread participation in digital programs(ICT, 2025; Okello, 2024). Furthermore, there is a shortage of qualified trainers and digital literacy programs tailored to the needs of rural populations, further exacerbating the digital divide(Okello, 2024).

Despite these challenges, there are opportunities to bridge the gap. Government and private sector initiatives, such as the expansion of broadband infrastructure and the introduction of community digital hubs, present avenues for increasing digital access(ICT, 2025). Mobile technology also offers a promising solution, as many rural citizens own mobile phones that can be leveraged for digital literacy training. Moreover, partnerships between government agencies, non-governmental organizations, and educational institutions can enhance the delivery and sustainability of digital literacy programs by developing localized, culturally relevant training content. Implementing policies that provide subsidies for digital devices and internet access can further promote digital inclusion in marginalized areas (ICT, 2025; Mensah et al., 2025; Okello, 2024).

2.4 ICTA's Digital Literacy Skills Framework

The Information and Communication Technology Authority (ICTA) of Kenya has developed various initiatives to promote digital literacy, with a particular focus on public institutions and the education sector. The Digital Literacy Programme (DLP), for instance, aims to integrate digital skills into primary education by providing digital devices and training teachers in ICT skills(ICT, 2025). However, while such programs are beneficial, they largely focus on the education sector, leaving significant gaps in adult digital literacy training and community-based initiatives.

ICTA's digital literacy framework emphasizes basic ICT skills, including computer literacy, internet usage, and cybersecurity awareness. Several studies note that this framework lacks a standardized approach to lifelong digital learning and does not fully address the unique challenges faced by marginalized communities (Manyasa, 2022; Mensah et al., 2025; Okello, 2024). The absence of an adaptive and inclusive curriculum that caters to individuals with varying levels of digital proficiency further limits the framework's effectiveness. Additionally, funding constraints and inconsistent policy implementation have hindered the scalability and sustainability of ICTA's digital literacy initiatives (Manyasa, 2022; Mensah et al., 2025).

ICTA's digital literacy framework needs to adopt a more comprehensive and inclusive approach so as to enhance its impact. This includes expanding training programs beyond formal education settings to reach adults and vulnerable groups, integrating digital literacy with entrepreneurship training, and leveraging public-private partnerships to enhance resource mobilization(ICT, 2025; Mensah et al., 2025). Furthermore, developing a monitoring and evaluation mechanism to track progress and impact will ensure that digital literacy programs remain responsive to evolving technological advancements and societal needs.

Proposed Framework is shown in Figure 1

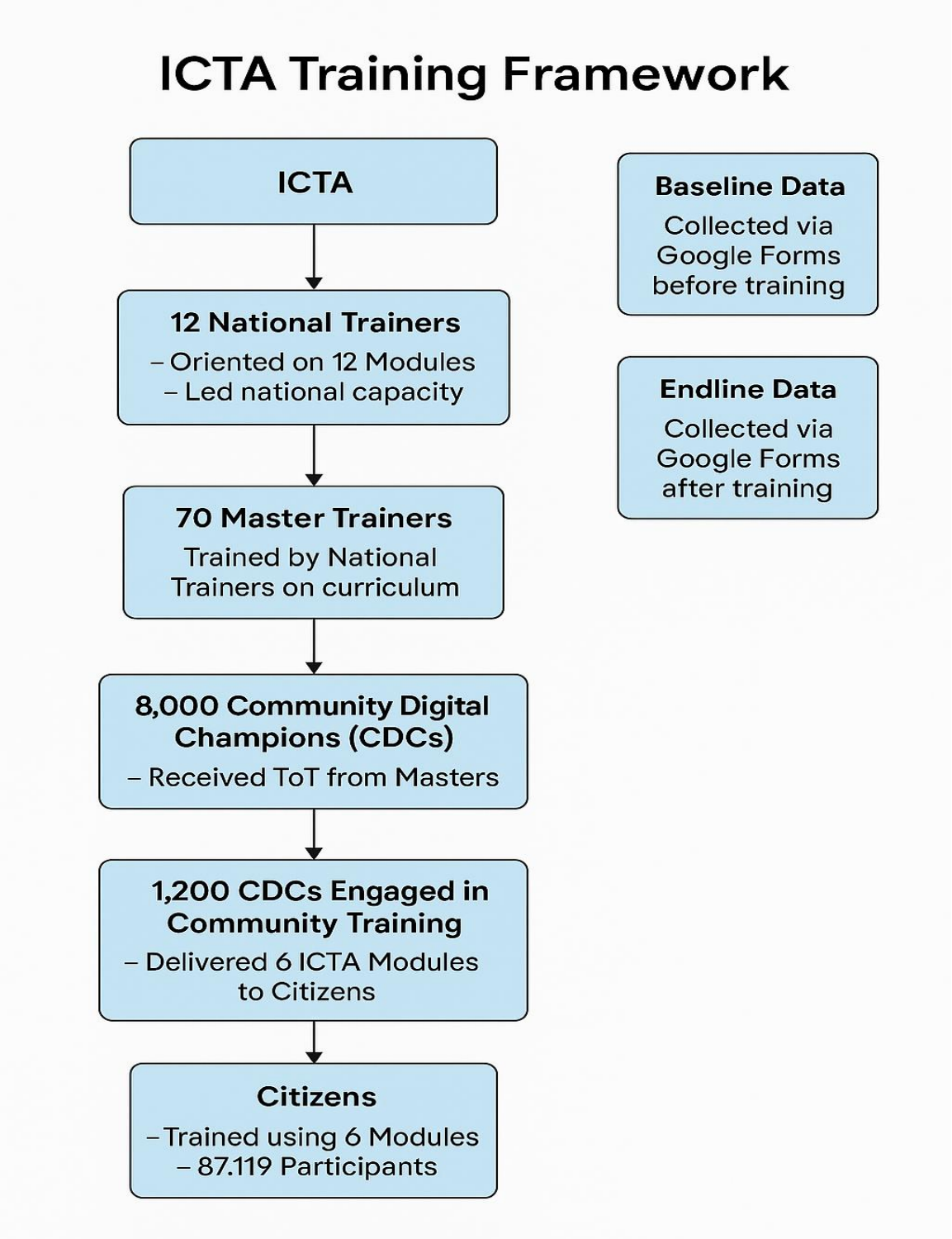


Figure 1: ICTA Foundational Digital Literacy Training Framework

3. METHODOLOGY

3.1 Study Design

This study adopted a quasi-experimental design with a pre-test and post-test structure to evaluate the effectiveness of the ICTA foundational digital literacy training framework. The aim was to assess digital literacy gains among participants following the delivery of a structured digital skills curriculum. Baseline and endline data were collected and compared to evaluate knowledge acquisition across six core digital literacy modules.

3.2 Sampling Procedure

Participants were drawn from the "Strengthening Digital Communities: Narrowing the Digital Divide in Two Kenyan Counties" initiative, which targeted both Mandera and Busia counties. Sampling was conducted proportionally across sub-counties using stratified sampling, based on available baseline and endline records. This ensured representation from diverse demographic segments, including gender, age, disability status, and employment status. A total of 87,119 valid participant records were included after cleaning and de-duplication.

3.3 Training Intervention

The ICTA foundational digital literacy training framework was structured into six modules designed to be covered in 16 hours, staggered over time to allow for flexible community-based participation. The modules included:

- F101: Introduction to ICT and Digital Devices
- F102: Internet Navigation and Communication Tools
- F103: Digital Citizenship and Cybersecurity
- F104: Accessing Government Services Online
- F105: Entrepreneurship and Digital Marketing
- F106: Using Digital Tools for Everyday Life

Training sessions were facilitated by trained digital literacy instructors and delivered one-on-one, face-to-face, and where possible, through local community centres, public institutions, and digital hubs, depending on infrastructure availability. Efforts were made to ensure inclusive access, including provisions for persons with disabilities.

3.4 Data Collection and Analysis

Digital literacy levels were assessed through self-reported skill ratings on a 5-point Likert scale (1 = Very Low, 5 = Very High) for each module at baseline and again at endline. Data cleaning involved removing duplicate entries and validating only those records that had both baseline and endline responses.

To measure the effectiveness of the training, a paired samples t-test was conducted for each module. Additionally, linear regression modeling and effect size calculations (Cohen's d and Hedges' g) were used to determine the magnitude of change and statistical significance.

3.5 Ethical Considerations

All data used in this study were anonymised to protect participants' identities. Informed consent was obtained at the start of training, and participation was voluntary. The project adhered to ethical guidelines established for community-based digital inclusion initiatives in Kenya.

4. RESULTS & DISCUSSION

4.1 Demographics

1.1 County Data

The cleaned dataset (Table 1) comprises a total of 87,119 valid entries for citizens who received digital literacy training as part of the community project “Strengthening Digital Communities: Narrowing the Digital Divide in Two Kenyan Counties.” Busia County accounts for the majority of the trained individuals, with 53,405 people (61.3%), followed by Mandera County with 33,532 individuals (38.5%). A small fraction of the data, 182 individuals (0.2%), comes from other counties, possibly due to cross-county participation or data recording anomalies.

Table 1 Data Records for analysis after Cleaning

County	Frequency	Percent	Valid Percent	Cumulative Percent
Busia	53405	61.3	61.3	61.3
Mandera	33532	38.5	38.5	99.8
Others	182	0.2	0.2	100.0
Total	87119	100.0	100.0	

1.2 Gender Distribution

Table 2 demonstrates a relatively balanced gender distribution among the 87,119 citizens who received digital literacy training in the "Strengthening Digital Communities" project across Mandera and Busia counties, Kenya, with women comprising 51.0% (44,420) and men 49.0% (42,699) of the participants; this near-equal representation suggests successful efforts in ensuring equitable access and potentially highlights a focus on empowering women, contributing significantly to bridging the digital divide in these regions.

Table 2 Gender Distribution

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Female	44420	51.0	51.0	51.0
Male	42699	49.0	49.0	100.0
Total	87119	100.0	100.0	

1.3 PWD Distribution

The data presented in Table 3 show the distribution of persons with disabilities (PWDs) among citizens trained in digital literacy skills in the two Kenyan counties. Out of the total of 87,119 citizens, the vast majority, 97.5% (84,961 individuals), reported that they do not have a disability. Only 2.5% (2,158 individuals) reported having a disability. This indicates that, although the project reached a broad population, a small proportion of the beneficiaries were

individuals with disabilities. This could suggest that there may be a need for tailored digital literacy interventions to ensure that people with disabilities are adequately represented and supported in such initiatives. The removal of duplicate records and the use of the baseline and endline data ensures that the findings are based on unique and accurate entries, reflecting the true distribution of PWDs in the community project.

Table 3: PWD Distribution

PWD	Frequency	Percent	Valid Percent	Cumulative Percent
No	84961	97.5	97.5	97.5
Yes	2158	2.5	2.5	100
Total	87119	100	100	

1.4 Age Distribution

The age distribution data from Table 4 provides insights into the demographic makeup of citizens trained on digital literacy skills in the two Kenyan counties, revealing a diverse range of age groups. The largest group, 33.9% (29,565 individuals), falls within the 26-35 age range, indicating significant participation from young adults. The second-largest group is the 18-25 age range, comprising 17.4% (15,187 individuals) of participants, reflecting strong involvement from younger citizens. Other notable groups include the 36-45 age range (25.2%, 21,959 individuals) and the 46-55 age range (12.8%, 11,115 individuals), which together account for nearly 40% of the total participants. Additionally, there is noticeable participation from older age groups, with 5.7% of participants aged 56-60, and small percentages from individuals aged 61 and older, reaching 1% for those aged 71 and above. This age distribution highlights that the digital literacy training has engaged a broad spectrum of citizens, particularly young adults (18-45 years old), while also reaching older individuals, thereby contributing to narrowing the digital divide in these communities. The removal of duplicate records ensures the accuracy of these findings.

Table 4: Age Distribution

Age	Frequency	Percent	Valid Percent	Cumulative Percent
18-25	15187	17.4	17.4	17.4
26-35	29565	33.9	33.9	51.4
36-45	21959	25.2	25.2	76.6
46-55	11115	12.8	12.8	89.3
56-60	4958	5.7	5.7	95
61-65	2259	2.6	2.6	97.6
66-70	1188	1.4	1.4	99
71+	888	1	1	100
Total	87119	100	100	

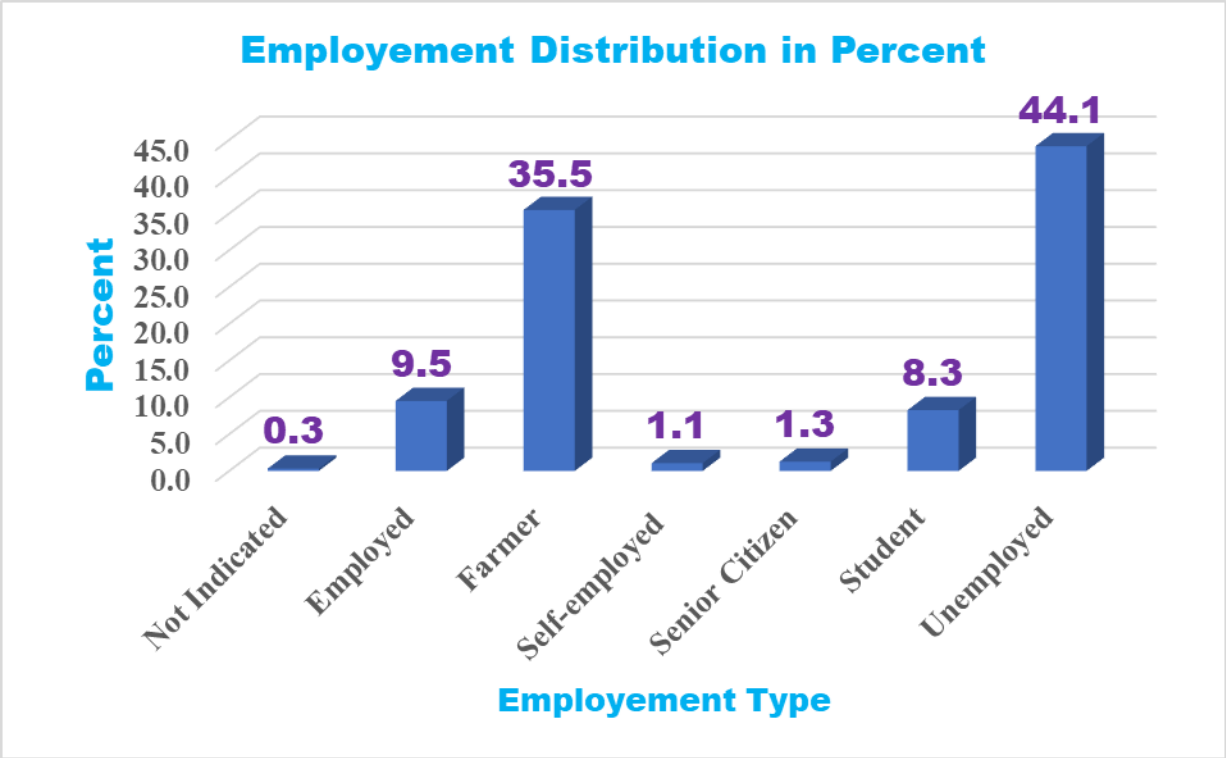
1.5 Employment Distribution

The employment distribution from the "Strengthening Digital Communities" project reveals a stark contrast in economic activities between Mandera and Busia counties. While a substantial 35.5% of respondents engage in farming, highlighting its critical role in the region, particularly in Mandera's ASALs, a concerning 44.1% report being unemployed. This dominant unemployment figure underscores a significant economic challenge, overshadowing the relatively small percentages of employed individuals (9.5%), self-employed (1.1%), and senior citizens (1.3%). Additionally, the 8.3% of students suggests a focus on education, though its impact on immediate economic participation remains to be seen.

Table 5- Employment Distribution

Employment	Frequency	Percent	Valid Percent	Cumulative Percent
Not Indicated	271	0.3	0.3	0.3
Employed	8289	9.5	9.5	9.8
Farmer	30903	35.5	35.5	45.3
Self-employed	919	1.1	1.1	46.4
Senior Citizen	1092	1.3	1.3	47.6
Student	7191	8.3	8.3	55.9
Unemployed	38454	44.1	44.1	100.0
Total	87119	100.0	100.0	

The data points to the necessity of addressing unemployment as a central focus for the digital literacy project. Although farming is a major livelihood, the high unemployment rate indicates a pressing need for diversification and economic empowerment beyond agriculture. The small percentage of self-employed individuals suggests potential for growth through digital literacy initiatives that foster entrepreneurship. By targeting interventions to bridge the digital divide and encourage digital skills in diverse sectors, the project can potentially improve economic outcomes and create sustainable opportunities for the communities in these Kenyan counties.



4.1 Training Effectiveness

The training effectiveness of the ICTA curriculum was evaluated using a paired T-test

Table 1 shows the baseline descriptive statistics results, noting that the scores were rated on a scale of 1 (lowest) to 5 (highest), indicating a generally average to below-average baseline knowledge across modules.

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Table 1: Baseline Descriptives Results

Descriptive Statistics

Module	N	Minimum	Maximum	Baseline	Std. Deviation
F101	84852	1.00	5.00	3.31	1.19
F102	84852	1.00	5.00	3.14	1.23
F103	87115	1.00	5.00	3.01	1.21
F104	87115	1.00	5.00	3.05	1.17
F105	84852	1.00	5.00	2.98	1.23
F106	84852	1.00	5.00	2.97	1.20
Valid N (listwise)	84852				

Table 2 Endline Descriptives Results

Descriptive Statistics

Module	N	Minimum	Maximum	Endline	Std. Deviation
F101_mel	79992	2.00	5.00	4.21	0.73
MSC_mel	85207	1.00	5.00	4.00	0.96
DBD_mel	86972	1.00	5.00	3.96	0.96
AGS_mel	86959	1.00	5.00	3.93	0.97
CHE_mel	85207	1.00	5.00	3.94	0.99
EWN_mel	85207	1.00	5.00	3.94	0.98
Valid N (listwise)	79992				

From Figure 1, there is clear improvement across all modules. Mean scores above 3.9 indicate strong post-training effectiveness.

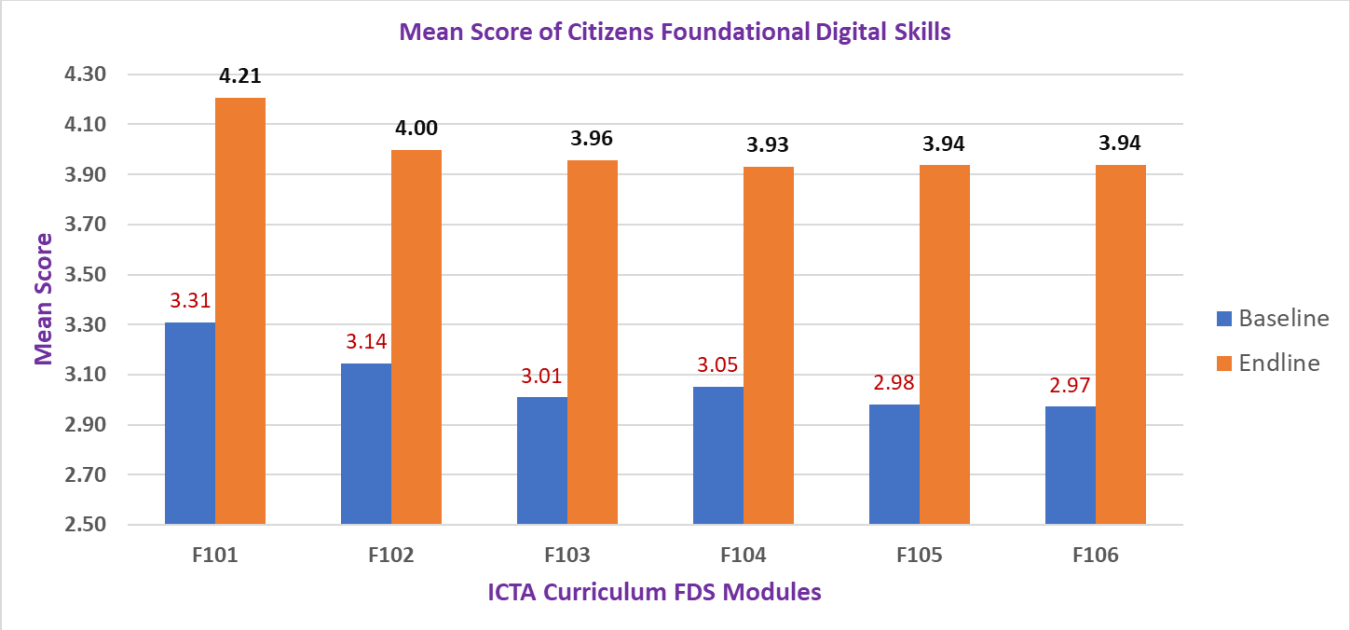

Figure 1: Comparison of Mean Scores between Baseline and Endline

The comparison of mean scores between baseline and endline reveals a clear positive shift across all modules, indicating that participants gained significant knowledge and skills through the training. For instance, mean scores increased from 2.97 to 3.94 and from 3.31 to 4.21, reflecting notable improvements in understanding and confidence in the covered topics. Additionally, the reduction in standard deviation at endline suggests that participants' performance became more consistent, with less variation in scores—further reinforcing the effectiveness and uniform delivery of the ICTA training curriculum.

Modeling of the ICTA Curriculum Effectiveness

A linear regression model for the ICTA Digital Skills training effectiveness was done using T-Test for Paired Means

Table: Paired Samples Statistics

	Paired Samples Statistics	Mean	N	Std. Deviation	Std. Error Mean
Pair 1	F101 Baseline	3.40	79557.00	1.15	0.00
	F101 Endline	4.21	79557.00	0.73	0.00
Pair 2	F102 Baseline	3.14	84764.00	1.23	0.00
	F102 Endline	4.00	84764.00	0.96	0.00
Pair 3	F103 Baseline	3.01	86968.00	1.21	0.00
	F103 Endline	3.96	86968.00	0.96	0.00
Pair 4	F104 Baseline	3.05	86955.00	1.17	0.00
	F104 Endline	3.93	86955.00	0.97	0.00
Pair 5	F105 Baseline	2.98	84764.00	1.23	0.00
	F105 Endline	3.94	84764.00	0.99	0.00
Pair 6	F106 Baseline	2.97	84764.00	1.20	0.00
	F106 Endline	3.94	84764.00	0.98	0.00

The paired samples correlation analysis demonstrates a statistically significant positive relationship between baseline and endline scores for all six measures. For instance, the correlation between the F101 baseline and endline scores is 0.33, signifying a moderate positive association. This suggests that individuals who exhibited higher digital literacy levels at baseline also tended to show higher levels at endline. This correlation underscores a degree of consistency in individual performance while also acknowledging the influence of other factors contributing to the observed improvements.

Table: Paired Samples Correlations

	Paired Samples Correlations			Significance	
Pair 1	F101 Baseline & F101 Endline	N	Correlation	One-Sided p	Two-Sided p
Pair 2	F102 Baseline & F102 Endline	84764	0.42	0.00	0.00
Pair 3	F103 Baseline & F103 Endline	86968	0.39	0.00	0.00
Pair 4	F104 Baseline & F104 Endline	86955	0.38	0.00	0.00
Pair 5	F105 Baseline & F105 Endline	84764	0.38	0.00	0.00
Pair 6	F106 Baseline & F106 Endline	84764	0.38	0.00	0.00

The paired samples t-tests further corroborate the significant improvements in digital literacy. The analysis confirms statistically significant differences between baseline and endline scores across all measures. The negative mean differences, such as -0.81 for F101 and -0.96 for F105, indicate a clear increase in scores from baseline to endline. The extremely large t-values and p-values less than 0.001 reinforce the statistical significance of these changes, confirming that the observed improvements are not due to chance.

Paired Samples Test

		Paired Differences					t	df	Significance	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				One-Sided p	Two-Sided p
					Lower	Upper				
Pair 1	F101 Baseline - F101 Endline	-0.81	1.14	0.00	-0.82	-0.80	-200.82	79556	0.00	0.00
Pair 2	F102 Baseline - F102 Endline	-0.86	1.20	0.00	-0.86	-0.85	-207.01	84763	0.00	0.00
Pair 3	F103 Baseline - F103 Endline	-0.95	1.22	0.00	-0.96	-0.94	-228.49	86967	0.00	0.00
Pair 4	F104 Baseline - F104 Endline	-0.88	1.21	0.00	-0.89	-0.87	-215.46	86954	0.00	0.00
Pair 5	F105 Baseline - F105 Endline	-0.96	1.25	0.00	-0.96	-0.95	-222.52	84763	0.00	0.00
Pair 6	F106 Baseline - F106 Endline	-0.97	1.23	0.00	-0.97	-0.96	-229.09	84763	0.00	0.00

Finally, the effect sizes, measured by Cohen's d, are consistently large, ranging from 1.14 for F101 to 1.25 for F105. This indicates that the observed differences between baseline and endline scores are not only statistically significant but also practically meaningful. The substantial Cohen's d values suggest that the interventions implemented to enhance digital literacy have had a significant and impactful effect on the participants' skills, underscoring the project's success.

Table: Paired Samples Effect Sizes

Paired Samples Effect Sizes			Standardizer	Point Estimate	95% Confidence Interval	
					Lower	Upper
Pair 1	F101 Baseline - F101 Endline	Cohen's d	1.14	-0.71	-0.72	-0.70
		Hedges' correction	1.14	-0.71	-0.72	-0.70
Pair 2	F102 Baseline - F102 Endline	Cohen's d	1.20	-0.71	-0.72	-0.70
		Hedges' correction	1.20	-0.71	-0.72	-0.70
Pair 3	F103 Baseline - F103 Endline	Cohen's d	1.22	-0.77	-0.78	-0.77
		Hedges' correction	1.22	-0.77	-0.78	-0.77

Pair 4	F104 Baseline - F104 Endline	Cohen's d	1.21	-0.73	-0.74	-0.72
		Hedges' correction	1.21	-0.73	-0.74	-0.72
Pair 5	F105 Baseline - F105 Endline	Cohen's d	1.25	-0.76	-0.77	-0.76
		Hedges' correction	1.25	-0.76	-0.77	-0.76
Pair 6	F106 Baseline - F106 Endline	Cohen's d	1.23	-0.79	-0.79	-0.78
		Hedges' correction	1.23	-0.79	-0.79	-0.78

a. The denominator used in estimating the effect sizes.

The paired samples effect sizes show strong evidence of substantial learning gains across all training modules, with Cohen's d values ranging from 1.14 to 1.25. These effect sizes indicate very large impacts of the training, as values above 0.8 are typically considered large in educational and behavioral research. The results suggest that the ICTA training had a highly significant and meaningful effect on participants' knowledge and skills across all modules (F101–F106). The narrow and consistent 95% confidence intervals (e.g., -0.72 to -0.70) reflect a high level of precision in the estimates. The inclusion of Hedges' correction, which adjusts for sample size bias, yields similar effect sizes, reinforcing the robustness of the findings. Overall, these results confirm the training's strong effectiveness in narrowing digital skills gaps among beneficiaries in the targeted counties.

5.0 DISCUSSION

The findings of this study underscore the significant effectiveness of the ICTA foundational digital literacy training in enhancing participants' digital competencies across the six core modules. The large sample size (N = 87,119) and substantial effect sizes (Cohen's d ranging from 1.14 to 1.25) affirm not only the statistical significance but also the practical impact of the training intervention. These results align with prior research that emphasizes the transformative potential of structured digital literacy training in promoting citizen empowerment and socio-economic participation (Lohr, 2025; Ojokheta & Onimisi, 2025) The improvement in endline scores across all modules suggests that the staggered 16-hour training model, grounded in contextual and community-based delivery, was effective in facilitating learning retention. This supports findings by (Zhang, 2025), who highlighted that modular, time-distributed training enhances digital skill uptake among adult learners, particularly in underserved areas.

Importantly, the proportional representation from sub-counties, inclusive gender participation (51% female), and reach across diverse age groups (18–71+) reflect deliberate equity-focused program design. Yet, only 2.5% of participants identified as persons with disabilities (PWDs), indicating the need for more inclusive outreach and adaptive tools for accessible learning, echoing concerns raised by (Manyasa, 2022)and (Mensah et al., 2025) regarding digital exclusion of marginalized groups.

High unemployment rates (44.1%) among participants highlight the urgency of aligning digital skills training with economic empowerment strategies. Digital literacy, when integrated with entrepreneurship and job-readiness content, can support livelihoods and reduce digital poverty(ICT, 2025; Okello, 2024). This study also validates the use of a national-level framework for standardized digital literacy implementation. The structured six-module approach provides a scalable model that can be adapted across Kenya and similar contexts in Sub-Saharan Africa. However, sustainability will depend on continued investment in infrastructure, local trainer capacity, and policy alignment. Future research should explore longitudinal impacts of digital literacy on employment, civic engagement, and digital inclusion. Moreover, integrating adaptive learning platforms could further personalize and optimize training delivery.

6.0 CONCLUSION

This study demonstrates the strong effectiveness of ICTA's foundational digital literacy framework in enhancing citizens' digital skills across diverse demographics in Kenya. The significant improvement in endline scores across all six modules affirms the value of structured, modular training delivered at community level. These findings reinforce prior research that highlights the critical role of digital literacy in enabling social inclusion, economic participation, and digital citizenship (Lohr, 2025; Okello, 2024). However, the low inclusion of persons with disabilities and the high unemployment rate among participants underscore the need for more inclusive and economically responsive programming(Manyasa, 2022; Mensah et al., 2025). Future initiatives should integrate accessibility solutions and align digital training with employment and entrepreneurial pathways. A national framework like ICTA's offers a scalable model for narrowing the digital divide, particularly when contextualized for marginalized and food-insecure populations.

7.0 RECOMMENDATIONS

To enhance impact, future ICTA digital literacy programs should prioritize inclusive outreach strategies targeting persons with disabilities and unemployed youth. Integrating digital skills with entrepreneurship and job-readiness training will improve economic outcomes(Mensah et al., 2025; Okello, 2024). Additionally, localizing content in native languages and leveraging mobile platforms can boost accessibility and retention(Lohr, 2025; Zhang, 2025). Strengthening public-private partnerships and embedding monitoring mechanisms will ensure sustainability and adaptability of the framework in evolving digital landscapes(ICT, 2025).

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